CERTAIN EATERS OF MUSHROOMS.

Hollis Webster.

With three feet of snow under foot in the woods one hardly has an eye out for mushrooms. Nothing was farther from my thoughts, one bright day last February, as I was laboring up one of the hills in Jackson, New Hampshire. As I caught the end of a convenient fir branch a little a head of me to pull myself a step or two higher up the slope, I noticed something familiar fixed in a fork. Scrambling up to it, I recognized — or thought I did — the remnant of a Tricholoma, a fragment of stem and pileus, nibbled at the edges, and dry as a chip. "Squirrels," I said to myself; for I had often seen red squirrels laying up bits of mushrooms in this way. In the late autumn they are often very busy cutting and carrying off stores of mushroom food to neighboring trees and bushes, where they lodge them under protecting ends of bark, or in convenient forks. Just the object of this bestowal of the food I have been unable to make out. They leave it exposed, and, as my bit of Tricholoma showed, sometimes abandon it altogether. To stay their appetite while working, they often take a mushroom lunch, seated on a convenient stump or tussock, leaving behind them scattered crumbs, and discarded stems. I have watched them making havoc with a fine clump of *Tricholoma portentosum* which I might not have seen had they not scratched away the pine needles under which it was hidden. Has anyone ever seen gray squirrels similarly busy, or engaged in eating fungi?

Though the larvae of insects are no doubt the most confirmed mushroom-eaters, there must be many other animals that feed upon them. It would be interesting to know how many. One would suppose that rabbits might find them toothsome. Mr. Peck suggests that deer feed upon certain kinds — for instance, *Armillaria mellea*, Cattle are said to browse occasionally on *Agaricus campestris* — and perhaps on other kinds — as, for instance, a heavy, fleshy Armillaria, about which there is a tale from Maine. I know that cattle are not afraid to eat even a poisonous species, as the following instance will show.

Two summers ago in Alstead, New Hampshire, as I was passing among the scattered bushes in an upland pasture, I was escorted by

a troop of yearling heifers, that watched me inquisitively. From admiring them my eyes strayed to the ground and fell on some truly superb buttons — they can be superb — of *Amanita muscaria*. I dug one up, cut it, pointed out its characteristics to a companion, and tossed it to the ground again — right under the nose of a black heifer, that had come closer than the others — no doubt hoping for salt. She sniffed at the Amanita, put her tongue to it and then to my surprise ate it as she would an apple. I was a little alarmed, but on second thought, seeing that the mischief was done, it seemed a pity not to make the experiment more conclusive. So I tossed her a second button, which she ate as readily as she had the first. Nothing remained but to wait, or to look for a dead heifer next day. Meanwhile her companions, would serve as a "control." Next day the black heifer was as well as ever, and again sniffing for salt — or for more Amanita. It was perhaps neglectful not to have stayed by her during the hours immediately following her luncheon. Then I should have been able to say whether she suffered any inconvenience. But she certainly was unharmed. If any one wishes to repeat this experiment, I may remark, for his guidance, that mine was made without the knowledge of the owner of the heifer.

Other animals are known to eat fungi. In Gentry's "Intelligence in Plants and Animals" — not a profoundly scientific work — is an excellent photograph (opposite page 200) of a box turtle that has been feeding on what looks like a Boletus. The picture is a counterpart of what I once saw somewhere on Cape Cod. At the edge of some low woods, I came suddenly on a box turtle that had just taken a bite from the pileus of a fresh *Amanitopsis vaginata*. At least I so inferred from the shape of the bite, and from the attitude of the turtle. In the hope that he would take another mouthful, I watched him for some time, but in vain. My patience was exhausted before he stirred, or even altered the pose of his extended head. Numerous observers can, I believe, attest the fact, and one has told me that he has seen these turtles eat poisonous species.

Whether any use of fungi is made by birds I cannot say from personal observation; but I am told by an ornithologist of experience that he has never seen birds eating toadstools. Yet I have seen toadstools with the marks of the bills of birds, but they may have been after insects. I have, however, a record of one instance given me by an observer who vouches for the truth of it. His curiosity

was excited early one autumn morning by the noisy activity of a flock of crows in a field within sight of his bedroom window. He perhaps would have thought no more of the matter had not the same thing occurred on the following day. This stimulated him to investigate. On reaching the spot he found that the crows had been feeding on *Agaricus campestris* which was growing there in abundance. The evidence was unmistakable. Amused at their careless betrayal of their plunder — so unlike the usual behavior of mycophagists — he took measures to anticipate and disappoint the crows thereafter.

CAMBRIDGE, MASSACHUSETTS.

A NOTE UPON RECENT TREATMENT OF HABENARIA HYPERBOREA AND ITS ALLIES.

A. LE ROY ANDREWS.

DR. RYDBERG'S elaboration of this puzzling section of the genus Habenaria in the Bulletin of the Torrey Botanical Club, for November, 1901 (pp. 605–632) recalls notes which I have been accumulating for several years which seem to find their explanation in it. The section has been subject to a variety of treatment, from that of Kraenzlin on the one hand, who reduces its American representatives to two species including as varieties of *Platanthera hyperborea* such distinct forms as Lindley's *Platanthera dilatata*, *P. convallariaefolia* and *P. leucostachys*, to that of Dr. Rydberg, who, maintaining the other extreme, restores the species of Lindley and other authors and adds a number of new ones until the two have become twenty-three. For these he institutes a new genus Limnorchis.

The portion of his key including the six species to which he definitely assigns stations in New England is as follows.—

Flowers green.
  Spur decidedly clavate, thickened and obtuse at apex, shorter than lip.
    1. *L. major* (Lange) Rydb.
  Spur slender, scarcely thickened toward apex, often acutish, equalling or slightly exceeding lip.
    Plant tall and stout; flowers comparatively large; sepals 4–6 mm. long.
      2. *L. media* Rydb.
    Plant slender, flowers small; sepals 2.5–4 mm. long.
      Flowers almost erect in rather lax spike.
        3. *L. Huronensis* (Nutt.) Rydb.